Submit Form

ADEQ Arizona Department of Environmental Quality

Water Quality Improvement Grant Program

Grant Application Form

○ **Water Quality Improvement Grant** ◉ **Watershed Preservation Grant**

Project Summary

Project Title: Sediment Discharge Reduction Through Brush Management in the Altar Valley

Project Description:
Provide an abstract that briefly describes the project.
Limit: 500 characters

Mesquite encroachment in the Altar Valley, 30 miles southwest of Tucson, has reduced historic grasslands and vegetation cover, causing increased erosion, soil loss, and high rates of sediment pollution downstream. The Altar Valley Conservation Alliance (AVCA) is proposing the use of the aerially applied herbicide, Sendero Plus Premix, to reduce mesquite densities on 2,000 acres of rangeland to promote the return of desert grassland, improve soil conservation, and reduce sediment discharge.

Authorizing Agency

Name: Altar Valley Conservation Alliance

Address: PO Box 27906

City: Tucson State: AZ Zip Code: 85726

Authorizing Agency Contact

Last Name: Thompson First Name: Kyle

Title: Science and Conservation Coordina Phone Number: 928-368-7067 Fax Number:

E-mail: kyle@altarvalleyconservation.org

Project Manager

Last Name: Thompson First Name: Kyle

Title: Science and Conservation Coordina Phone Number: 928-368-7067 Fax Number:

E-mail: kyle@altarvalleyconservation.org

Project Period ○ 1 year ◉ 2 years

Project Costs

Total Project Cost: $370,393.00

Funds Requested *(maximum 60% of total project cost)* $220,200.00

Matching Funds *(minimum 40% of total project cost)* $150,193.00

Application Details

I. Location and Land Ownership

a. City/Town: Nearest town is ThreePoints County: PimaCounty

b. Land Ownership: StateTrustLands

c. Provide Latitude and Longitude in decimal degrees for the main location of the project

Latitude: 31.826119 Longitude: -111.512607

How do I find the latitude and longitude of my area? Click here

d. Provide a map of the project area. For assistance in developing a map, contact the ADEQ Grant Coordinator

II. Pollutant(s) of Concern

a. Is this water body identified as impaired based on *ADEQ's 2010 Status of Ambient Surface Water Quality in Arizona Arizona's Integrated 305(b) Assessment and 303(d) Listing Report? Both reports can be found at* *http://www.azdeq.gov/programs/water-quality-programs/surface-water-monitoring-and-assessments* Contact ADEQ for assistance if necessary

b. Select the pollutant(s) of concern that this project will address.

Primary Pollutant: Sedimentation -Siltation Secondary Pollutant, *if any*: Pathogens (E Coli)

Other:

c. Clearly define the causes and sources of pollutants impacting the project area. Limit: 2500 characters

Mesquite (Prosopis spp.) encroachment in the Altar Valley over the past 100 years has caused increased sediment transport and downstream sediment pollution by reducing grass and vegetation cover and increasing erosion. The increase in mesquite density and the resulting reduction in grass/shrub/forb cover may destabilize soils, causing erosion and increased downstream sediment transport resulting in reduced water quality (Martin and Morton 1995, Grellier et al. 2012). The current and potential erosion due to mesquite encroachment is reflected in AVCA's rangeland condition mapping, completed in 2000, which identified almost 50% of the 776 square mile rangeland watershed soil condition as at risk to erosion.

According to AVCA's 2001 Watershed Resource Assessment Report, historically the broad floodplain of the Altar Valley was not incised and was dominated by giant sacaton (Sporobolos wrightii), the uplands were dominated by native perennial grasses, and mesquite was confined to drainages and margins of the floodplain. Currently, many washes throughout the valley have become significantly incised and mesquite dominates much of the uplands, outcompeting native perennial grasses. This mesquite encroachment in the upland areas represents a potential permanent shift from grassland to shrubland, accompanied by higher rates of sheet erosion, runoff, evapotranspiration, and sediment discharge, and correspondingly lower rates of water infiltration. It has been shown in other semi-arid systems, such as the San Pedro River system, that significant amounts of sediment can be transported from desert uplands, with the potential to carry nutrients, trace metals, and other contaminants (Nichols 2006, Nie et al. 2012).

III. Scope of Work

a. Briefly describe the management measures or best management practices to be implemented to improve water quality. Limit: 5000 characters

Reducing mesquite cover and encouraging grasses and forbs to return, can increase soil conservation, and watershed function and stability. In light of the need for mesquite control and improving the function of the watershed, we are proposing to use an aerially applied herbicide, Sendero Plus Premix (Sendero), to reduce the density of mesquite to a target level of 20% from current levels of approximately 50%-80% cover. The use of aerially applied herbicide has been chosen for this project because implementing prescribed burning in the Altar Valley is difficult due to liability, climate, and regulations; it is cost-effective at half the rate of hand cutting and a quarter the rate of mechanical clearing; and it causes little to no ground disturbance.

Sendero has been successfully and safely applied in southeast Arizona in cooperation with the Natural Resource Conservation Service (NRCS) with a success of 60-80% mesquite kill. Sendero is a foliar herbicide that enters mesquite through the leaves while becoming inactive on contact with soil, leaving no residual impacts on vegetation, livestock, or groundwater. There are limited, but immediate impacts on annual forbs and several other species, including false mesquite (Calliandra eriophylla), but these species have been shown to not be killed and return with the immediately following monsoon storms and completely return by the following year. Additionally, AVCA has a close relationship with the U.S. Fish and Wildlife Service (USFWS) and we are currently working with them to ensure that any Endangered Species Act compliances are met while working in endangered Pima pineapple cactus (Coryphantha scheeri var. robustispina) habitat.

AVCA and partners have been learning about the process of this treatment, including one-on-one meetings in September 2016 with Barry Wallace of Crop Production Services, a licensed herbicide applicator that has completed similar projects in Arizona, New Mexico, and Texas; attendance of a 1-day seminar at the Ladd Ranch near Bisbee, Arizona where Sendero has been applied annually for the past three years; and a visit with NRCS to view its application near Douglas in May 2017. Additionally, AVCA has a site visit scheduled on September 7, 2017 in the Altar Valley with Crop Production Services and partners including NRCS, Arizona State Land Department (ASLD), Arizona Game and Fish Department (AZGFD), Pima County, USFWS, and three local ranchers. AVCA has identified over 30,000 acres for potential mesquite control with 2,000 of those acres for immediate project implementation. The site would also act as a pilot test area for future treatments. After sites are confirmed and permitting approved, we would contract an herbicide applicator to aerially apply Sendero in approximately May 2018. Conditions for Sendero treatment to be effective include timing of the treatment to be 42-63 days after bud break on the mesquite, < 20% humidity, < 90° F air temperatures, > 75° F soil temperature at 12 inches, and < 7 mph wind speeds. AVCA would work with NRCS to implement the treatment based on their technical oversight.

We would use Quiet Creek Corporation that does remote sensing and geospatial analysis to monitor mesquite densities pre, post, and 1 year after treatment as well as repeat photography completed by AVCA staff and volunteers. Quiet Creek will utilize National Agriculture Imagery Program data sets to measure mesquite density or fly transects of the project area to create a Normalized Difference Vegetation Index (NDVI) orthomosaic. Changes in vegetation can then be characterized through changes in NDVI.

Reduction in mesquite densities to natural levels (10-20% cover), have been shown to reduce erosion and soil loss, leading to a reduction in sediment discharge. The reduction of mesquite densities would allow grasses and vegetation to begin growing in these areas from seed banks already in the soil and from surrounding areas including Bothriochloa barbinodis, Aristida purpurea, Digitaria californica, Calliandra eriophylla, and Lehmann lovegrass (Eragrostis lehmanniana). Lehmann lovegrass, while a non-native grass, is ubiquitous across southeast Arizona and it still provides structure for soil conservation and wildlife habitat. By reducing erosion and soil loss in the Altar Valley watershed, sediment transport and pollution will be reduced in the Altar Wash. If ADEQ funds this project for 2,000 acres, AVCA could apply for NRCS Environmental Quality Incentives Program (EQIP) funds (not included in the budget as match) which, if granted, would allow the project to be expanded to include additional acres, allowing for a larger area of impact. AVCA works through a strongly collaborative, science-based, community driven, and integrated approach to conserve healthy and productive working landscapes. Through our strong partnerships, we have the collective expertise to successfully implement this cost-effective and safe project.

b. Identify the permits, if any, to be obtained in order to complete this project. Consider the need for Army Corps of Engineers 404 Permits and 401 Certifications for in-stream activities, Construction General Permit coverage for projects impacting an area greater than one acre, NEPA permits from the USFS, and Applications for Land Improvements from the AZ State Land Department etc. All projects are subject to State Historical Preservation Office clearance. Limit: 1000 characters

AVCA and cooperating landowners must obtain the following permits to complete this project:

-Arizona State Land Department Land Treatment permit for State Trust land by the lessee
-Arizona Department of Agriculture Permit (form 1080)
-Clearance from US Air Force for use of drones or helicopters in Military Operating Area (MOA)

c. Life expectancy of BMPs: Identify and justify the life expectancy of any proposed BMPs. Limit: 1000 characters

The life expectancy of this Best Management Practice is 8-12 years—the period in which Kaib (1998) suggests that desert grasslands likely burned naturally and reduced mesquite densities. Fire regimes played a crucial role in maintaining the Altar Valley's grasslands by suppressing woody species and encouraging grass and vegetation growth (Sayre 2000, 2002). Currently, prescribed burning is difficult to implement and other management tools, such as herbicides, can be suitable replacements with similar outcomes and life expectancies. Additionally, future management of the area will be cheaper and easier to retreat after this initial treatment reduces the largest stands of mesquite.

d. Long-term Maintenance: Identify the maintenance required for your project. Identify groups or individuals responsible for the long-term maintenance of projects. Provide letters of support, if possible. Limit: 1000 characters

Long-term maintenance will be required for this project and commitments from AVCA and ranchers that manage the project area have been made (see attached letters). Maintenance of the project area will require a retreatment in 8-12 years. This retreatment may be in the form of herbicide, mechanical, and/or prescribed burn, with the advantage that AVCA would be broadening its toolkit for brush management by using Sendero for this initial treatment. Funds for future maintenance will be sought through private sources and federal or state grants, which AVCA has a good track record of receiving.

Letters of support are attached from three ranchers and AVCA members who own and/or manage the land that is planned for treatment, including Pat and John King, King's Anvil Ranch, Mary and Charley Miller, Elkhorn Ranch; and Walter Lane, Santa Margarita Ranch.

IV. Education and Outreach

a. Describe the education and outreach components that will enhance public understanding of the project and encourage implementing future management measures. Limit: 1000 characters

This brush control project would coincide with 3 workshops that are already planned and funded by a $70,000 grant from the USDA Western Sustainable Agriculture Research and Education grant on brush management. AVCA and the University of Arizona will be holding these workshops for western land managers in January 2018, May 2018, and September 2018. The methods, progress, and results from this project will be presented at these workshops as a case study in brush management. We expect to reach a large number of people through these workshops and we will be creating education materials including handouts, online materials, and three videos to be distributed for free online. This is a separate and already planned project and staff hours for this project would not be used for the WSARE project. AVCA also has a strong social media presence and a 500 person regional emailing last, where updates, information, monitoring results, and a final report about the project will be disseminated.

V. Key Personnel & Partnerships

a. Describe the roles and responsibilities of positions for this project. Include the overall salary and rate for each position. Limit: 1000 characters

Mary Miller, Executive Director ($75 per hour), will be the Project Director and will coordinate the work of project consultants and partners, and supervise all project staff. Kyle Thompson, Science and Conservation Coordinator ($50 per hour), will be the project manager and the point-person for on-the-ground work. Sarah King, Community Outreach & Education Coordinator ($40 per hour), will develop materials to publicize the project and outcomes to our partners through email, AVCA's website, and social media. Sherie Steele, Program Administrator ($40 per hour), will administer the project funds and other administrative tasks. Other key partners include Kerry Baldwin, Wildvision Arizona; Kristen Egen, Natural Resource Conservation Service; Alisha Phipps, Natural Resource Conservation Service; Josh Grace, Arizona State Land Department; Scott Richardson Fish and Wildlife Service; Walter Lane, Santa Margarita Ranch; King family, King's Anvil Ranch; Mary and Charley Miller, Elkhorn Ranch.

b. Provide a brief summary of qualifications for individuals filling a position. If individuals have not yet been identified, describe the qualifications that will be used for an individual. Limit: 1000 characters

Mary Miller, Project Director. Mary has managed projects for the Altar Valley Conservation Alliance since its inception in 1995. Mary holds a Masters of Environmental Studies from the Yale School of Forestry and is also co-owner and co-manager of the Elkhorn Ranch, which includes extensive personnel management and oversight, ongoing land management and conservation, and over 30 years experience in brush management and control. Kyle Thompson, Project Manager holds a Bachelor of Science degree in Wildlife and Restoration Ecology and a Master of Science in Natural Resources, Wildlife Conservation and Management. Sarah King, the Outreach and Education Coordinator, has extensive knowledge and experience assisting with AVCA projects and in writing and publishing project progress and outcomes on AVCA's website and social media. Sherie Steele has held the position of Program Administrator since 2010 and worked extensively on all of AVCA's grant administration.

VI. Conflict of Interest

What steps will be taken to ensure that hiring/personnel selection practices are carried out without the existence or appearance of bias? Provide a statement of policy for hiring if possible. Limit: 1000 characters

AVCA will not need to hire any additional staff for this project; however, we will need to pay a contract herbicide applicator and aerial mapping service. All staff hours outlined in the budget will only be used for this ADEQ project related work. We will hire the most affordable herbicide applicator with the best references and outcomes of past projects. We will work with NRCS who is able to provide us contacts of qualified personnel under a non-bias policy. Quiet Creek Corporation is currently the only known licensed drone operator that is using aerial mapping for rangeland management in this region. AVCA has extensive experience with them and will use them for this project based on their affordability as successful track record.

VII. Budget Form

Develop a budget based on the anticipated costs for completing the project within the proposed time schedule. The budget form can be downloaded at http://static.azdeq.gov/wqigp/wqig_budget_form.xlsx . **Be sure to attach your budget form to your final application submission.** **Initials:** KT

VIII. Work Plan Steps

Develop a work plan with a series of steps and associated dates that are necessary to complete the plans. Each step must have a milestone that provides a description of what will be accomplished. Work plan must be developed as part of the budget form. The budget form can be downloaded at: http://static.azdeq.gov/wqigp/wqig_cycle_19_budget_form.xlsx **Initials:** KT

IX. SHPO Form

Any ADEQ action, including grant projects paid in-part with ADEQ funds, on state, federal, or private lands that may impact historic properties (i.e., any prehistoric or historic-period district, site, building, structure, or object included in, or eligible for inclusion in the State Register of Historic Places) require consultation with the State Historic Preservation Office (SHPO) pursuant to the State Historic Preservation Act (ARS 41-861 to 864).

In order to make informed decisions and facilitate consultation with SHPO, ADEQ requires applicants to provide the project-related information requested in the SHPO form. Please complete the information requested in the SHPO form and submit with your final application. The SHPO form can be downloaded from the ADEQ website at: http://static.azdeq.gov/wqigp/wqig_shpo.pdf. **Initials:** KT

X. Abbreviated Monitoring Plan

If water quality data are to be collected and interpreted to determine effectiveness, a "Sample Analysis and Quality Assurance Plan" (SAP/QAP) must be developed in accordance with state guidelines. Additional information for developing the abbreviated monitoring plan can be found at http://static.azdeq.gov/wqigp/wqig_abbrev_monitoring_plan.pdf. **Initials:** KT

XI. Project Insurance Coverage:

Providing proof of insurance coverage for your project is necessary upon award. Insurance requirement may be found in the grant manual. If you need assistance with contacting an insurance company to obtain required coverage for your project you may contact: https://insurance.az.gov/contact-us or (602) 364-3100, for assistance with insurance companies in your area. **Initials:** KT

Authority Signature Page

The undersigned hereby offers and agrees to perform in compliance with all terms, conditions, specifications, and scope in this grant application. Signature certifies understanding and compliance with the application attached hereto. ADEQ may approve the grant application and modifications to scope, methodology, and schedule, final projects, and/or budget.

Authorized Signature: _____ Date: 8/31/2017

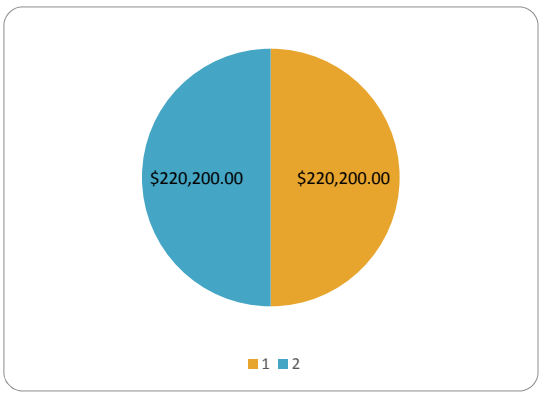
Printed Name: Kyle Thompson

Authority Signature Page must be submitted in hard copy and must be received prior to the Final Application deadline.

Grant Project Cost- Sediment Discharge Reduction Through Brush Management in the Altar

		PROJECT TASKS	Rate/ Unit/ # of Unit	Total Grant Budget	Prior Cost	Current Cost	Cumulative Cost	Remaining Budget
Acct 001	PROJECT ADMINISTRATION 10% Max of grant			$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal		**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Acct 002	PROJECT DEVELOPMENT	Science and Conservation Coordina	$25/hour/320	$8,000.00	$0.00	$0.00	$0.00	$8,000.00
		Executive Director oversight and per	$25/hour/64	$1,600.00	$0.00	$0.00	$0.00	$1,600.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal		**$9,600.00**	**$0.00**	**$0.00**	**$0.00**	**$9,600.00**
Acct 003	PROJECT DELIVERY (Direct Costs)	Hire contractor to carry out aerial he	$89/acre/2,000	$178,000.00	$0.00	$0.00	$0.00	$178,000.00
		Science and conservation coordinat	$25/hour/112	$2,800.00	$0.00	$0.00	$0.00	$2,800.00
		Executive Director oversight of the p	$25/hour/48	$1,200.00	$0.00	$0.00	$0.00	$1,200.00
		Quiet Creek Corporation (pre, post,	$2.5/acre/6,000	$15,000.00	$0.00	$0.00	$0.00	$15,000.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal		**$197,000.00**	**$0.00**	**$0.00**	**$0.00**	**$197,000.00**
Acct 004	PROJECT MANAGEMENT	Outreach and Education (1/2 value c	$20/hour/100	$2,000.00	$0.00	$0.00	$0.00	$2,000.00
		Science and Conservation Coordina	$25/hour/384	$9,600.00	$0.00	$0.00	$0.00	$9,600.00
		Executive Director Project Managem	$25/hour/80	$2,000.00	$0.00	$0.00	$0.00	$2,000.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
				$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal		**$13,600.00**	**$0.00**	**$0.00**	**$0.00**	**$13,600.00**
Acct 005	OTHER COST	Other cost		$0.00	$0.00	$0.00	$0.00	$0.00
		Other cost		$0.00	$0.00	$0.00	$0.00	$0.00
		Other cost		$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal		**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Grant Subtotals	**$220,200.00**	**$0.00**	**$0.00**	**$0.00**	**$220,200.00**
Match Subtotals	**$150,193.00**	**$0.00**	**$0.00**	**$0.00**	**$150,193.00**
Matching/All Funding %	**40.55%**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**40.55%**
Total Grant	**$370,393.00**	**$0.00**	**$0.00**	**$0.00**	**$370,393.00**



Total Budget	$220,200.00

Match Project Cost- Sediment Discharge Reduction Through Brush Management in the Altar Valley

		PROJECT TASKS	Total Match Budget	Prior Cost	Current Cost	Cumulative Cost	Remaining Budget
Acct M001	PROJECT ADMINISTRATION 10% Max of grant	Project Administration at 10% grant funds	$22,020.00	$0.00	$0.00	$0.00	$22,020.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal	**$22,020.00**	**$0.00**	**$0.00**	**$0.00**	**$22,020.00**
Acct M002	PROJECT DEVELOPMENT	Staff travel costs for site visit for planning	$889.20	$0.00	$0.00	$0.00	$889.20
		Site visit review with technical experts	$6,000.00	$0.00	$0.00	$0.00	$6,000.00
		Science and Conservation Coordinator staff time for mapping, permit application, and partner c	$8,000.00	$0.00	$0.00	$0.00	$8,000.00
		Executive Director oversight and permitting	$3,200.00	$0.00	$0.00	$0.00	$3,200.00
		Support and coordination from ranchers (2 days, 5 ranchers)	$6,000.00	$0.00	$0.00	$0.00	$6,000.00
		Subtotal	**$24,089.20**	**$0.00**	**$0.00**	**$0.00**	**$24,089.20**
Acct M003	PROJECT DELIVERY (Direct Cost)	Travel to site during completion of the project	$444.60	$0.00	$0.00	$0.00	$444.60
		Executive Director Project Management	$2,400.00	$0.00	$0.00	$0.00	$2,400.00
		Science and conservation coordinator project implementation and photo monitoring	$2,800.00	$0.00	$0.00	$0.00	$2,800.00
		Volunteers for Photo-Monitoring (2 people)	$3,600.00	$0.00	$0.00	$0.00	$3,600.00
		10,000 gallons water for herbicide mix	$150.00	$0.00	$0.00	$0.00	$150.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal	**$9,394.60**	**$0.00**	**$0.00**	**$0.00**	**$9,394.60**
Acct M004	PROJECT MANAGEMENT	Technical support and advice from AVCA Science Advisory Board (12 people x 5 days)	$36,000.00	$0.00	$0.00	$0.00	$36,000.00
		Support from ranchers of project and site overview and monitoring (5 ranchers, 14 days)	$42,000.00	$0.00	$0.00	$0.00	$42,000.00
		Outreach and Education	$2,000.00	$0.00	$0.00	$0.00	$2,000.00
		Science and Conservation Coordinator staff time for project management including contractor c	$9,600.00	$0.00	$0.00	$0.00	$9,600.00
		Executive Director Project Management	$4,000.00	$0.00	$0.00	$0.00	$4,000.00
		Staff travel to site for inspection and review	$889.20	$0.00	$0.00	$0.00	$889.20
			$0.00	$0.00	$0.00	$0.00	$0.00

		Subtotal	**$94,489.20**	**$0.00**	**$0.00**	**$0.00**	**$94,489.20**

$ -	OTHER COST	ArcGIS software subscription	$200.00	$0.00	$0.00	$0.00	$200.00
			$0.00	$0.00	$0.00	$0.00	$0.00
			$0.00	$0.00	$0.00	$0.00	$0.00
		Subtotal	**$200.00**	**$0.00**	**$0.00**	**$0.00**	**$200.00**

Match Subtotals	**$150,193.00**	**$0.00**	**$0.00**	**$0.00**	**$150,193.00**
Grant Subtotals	**$220,200.00**	**$0.00**	**$0.00**	**$0.00**	**$220,200.00**
Matching/All Funding %	**40.55%**	**#REF!**	**#REF!**	**#REF!**	**40.55%**
Total Grant	**$370,393.00**	**#REF!**	**#REF!**	**#REF!**	**$370,393.00**

Budget Narrative

Match Project Cost- Sediment Discharge Reduction Through Brush Management in the Altar Valley

Identify how costs were determined, including comparative quotes used to determine costs or worth where applicable as well as sources of all project match (funding and in-kind). Adequate justification should be provided to show that the cost of implementing the project is reasonable for the benefits anticipated toward

PROJECT ADMINISTRATION 10% Max of grant	**AVCA will cover all project administration costs at the maximum allowed 10%. AVCA will utilize our Project Administrator ($40/hour) and other operational costs including office supplies, space, and computer software to administer this project**
PROJECT DEVELOPMENT	**Grant funds will be used to pay 1/2 of the salary of full-time Science and Conservation Coordinator (SCC) at $25/hour ($50/hour full value) for 320 hours of work to complete the development of the project including permit applications, site visits, and coordination of contractors. Grant funds will also be used to pay for 1/3 of the value of the salary for the Executive Director at at $25/hour ($75/hour full value) for oversight of the project development and permitting at an estimated 64 hours. Matching funds will include travel to and from project sites and meeting with ranchers, 1/2 value of SCC time, and technical advice from expert partners including AZGFD, rangeland specialists, University of Arizona researchers, and ranchers (Federal time from NRCS and FWS not included in match). Rancher involvement, a critical part of project planning and management is estimated at 80 hours between 5 ranchers at an estimated $75/hour. Match travel funds will be utilized for AVCA staff to be reimbursed for travel to collaborative team and project meetings and site visits within the Altar Valley watershed and the Tucson, Arizona area. These costs are calculated at $.57 per mile for a total of 1560 miles (12 round trips to and from Tucson @ 130 miles). Site visits and review with technical experts will include approximately 80 hours between 5 people for project development ($75/hour/80 hours)**
PROJECT DELIVERY (Direct Costs)	**The majority of the funds will be used to pay for the actual herbicide contractor. The 2017 cost per acres from Crop Production Services is $89/acre. This includes everything for aerial application by helicopter including their travel to the site, herbicide preparation, and GIS/mapping for accurate application by helicopter. Grant funds will be used to pay 1/2 of the salary of our full-time Science and Conservation Coordinator for 112 hours of work to complete the delivery of the treatment. Grant funds will also pay for 1/3 of the salary for the Executive Directory for oversight of the project at approximately 48 hours. Grant funds will pay for monitoring, including photo monitoring and remote sensing through the experienced and cost-effective Quiet Creek Corporation at approximately $2.5 acres of two thousand acres, three times. Matching funds will include travel, 1/2 value of SCC time, project oversight by the Executive Director at the 2/3 of the full value of their position, and volunteer time for photo monitoring ($25/hour/144 hours). Travel for AVCA staff to be reimbursed for travel to collaborative team and project meetings and project site visits within the Altar Valley during the project treatment. These costs are calculated at $.57 per mile for a total of 1560 miles (6 round trips**
	Grant funds would pay for AVCA Outreach and Education Coordination hours, Science and Conservation Coordinator hours, and management hours by the Executive Director. We estimate 100 hours over 2 years of Outreach and Education Coordinator time will be needed to publicize and create educational materials about the project results at 1/2 the valued time at $20/hour. The Science and Conservation Coordinator will need and estimated 384 hours at 1/2 the value of their time and the Executive Director will need an estimated 80 hours for project management at 1/3 the

PROJECT MANAGEMENT	actual cost. Matching funds include 1/2 time for Outreach and Education Coordinator, AVCA Science Advisory Board for technical oversight and scientific review, 1/2 SCC time and travel, and 2/3 salary for Executive Director time. We will utilize our Science Advisory Board for oversight and direction of the project, which includes 12 experts in their respective fields from the University of Arizona and government agencies totaling an estimated 300 hours at an average $75/hour. Participating ranchers will include 5 persons that will participate in site visits and meetings for an estimated 400 hours at $75/hour. Travel funds will be utilized for AVCA staff and field experts to be reimbursed for travel to collaborative team and project meetings and project site visits for inspections and monitoring. These costs are calculated at $.57 per mile for a total of 1560 miles (12 round trips to and from Tucson @ 130 miles). We will also use this project as a case study in the an already funded 3-workshop series about brush management for western land managers-- funded by USDA Sustainable Agriculture Research and Education Grant (no matching funds used from this USDA)

OTHER COST	Matching funds not included in the above categories include only the cost of a discounted ESRI ArcGIS subscription at $100 per year for a total of $200. This is critical for the planning and development of the projects as well as outreach and education including online, public maps of the project area and results.

Milestones

Grant Project Cost- Sediment Discharge Reduction Through Brush Management in the Altar Valley

Start Date	Milestone	Work Plan Steps/per Milestone	Estimated Complet	Actual Con	Grant Funds	Match Funds	End Date
10/1/2017	Treatment Plan	Create treatment plan with applicator	11/1/2017		$4,800.00	$52,489.20	
		Outline Contract with herbicide applicator	11/1/2017	-	-		
		Site visits with ranchers and experts	11/1/2017	-	-		
10/1/2017	Obtain Permits	State land treatment permit	3/1/2018		$4,600.00	$5,600.00	
		Confirm no SHPO clearance needed based on no ground disturbance from aerial application	3/1/2018	-	-		
		Arizona Department of Agriculture (form 1080)	5/15/2018	-	-		
		Flight permission in military flight zones	4/1/2018	-	-		
11/1/2017	Confirm treatment date with applicator	Estimate best climatic conditions	4/1/2018		$200.00	$200.00	
11/1/2017	AVCA Annual Report	Update about project and upcoming treatment in our annual report	12/1/2017		$222.22	$222.22	
12/1/2017	Science Advisory Board Meeting	Present results and updates to Science Advisory Board for discussion and progress check	12/10/2017		$0.00	$4,500.00	
12/15/2017	Update Partners at twice-annual Fire Coordination Meeting	Give update at meeting with discussion about mesquite control	12/15/2017		$222.22	$222.22	
1/15/2017	Brush management Workshop #1 - Sustainable Agriculture Research and Education (SARE) funded	Use herbicide application as case study (pre treatment)	1/15/2018		$0.00	$0.00	
2/25/2018	Update Partners at twice-annual Fire Coordination Meeting	Give update at meeting with discussion about mesquite control	3/20/2018		$222.22	$222.22	
3/1/2018	Science Advisory Board Meeting	Present results and updates to Science Advisory Board for discussion and progress check	3/31/2018		$0.00	$4,500.00	
4/1/2018	Pre-treatment monitoring	Photo monitoring	5/1/2018		$5,600.00	$2,348.20	
		Remote Sensing completed by Quiet Creek	5/1/2018	-	-		
5/1/2018	Brush management workshop #2 - Sustainable Agriculture Research and Education (SARE) funded	Use herbicide application as case study (pre-treatment)	5/31/2018		$0.00	$0.00	
5/1/2018	Report writing and site inspections with staff, ranchers, and technical experts	Ongoing reporting, site monitoring, and reporting to Science Advisory Board about project from treatment date	9/30/2019		$9,600.00	$42,000.00	
5/1/2018	Treatment applications	Carry out herbicide treatment	5/30/2018		$180,200.00	$2,350.00	
6/1/2018	Post-treatment news update	Post-treatment e-news sent to our email list, social media, and website	6/20/2018		$222.22	$222.22	
6/1/2018	Science Advisory Board Meeting	Present results and updates to Science Advisory Board for discussion and progress check	6/15/2018		$0.00	$4,500.00	
5/20/2018	Altar Valley Community Meeting	Update ranching and agency partners on the outcome of the treatment at annual community meeting	6/5/2018		$222.22	$222.22	
6/20/2018	Post-treatment monitoring	Photo monitoring	6/30/2018		$5,600.00	$2,348.20	
		Remote Sensing completed by Quiet Creek	6/30/2018	-	-		
9/1/2018	Science Advisory Board Meeting	Preset results and updates to Science Advisory Board for discussion and progress check	9/30/2018		$0.00	$4,500.00	
9/1/2018	Brush management Workshop #3 - Sustainable Agriculture Research and Education (SARE) funded	Use herbicide application as case study (post treatment)	9/30/2019		$0.00	$0.00	
9/1/2018	AVCA Annual Report	Feature results from mesquite spraying project in our annual report	12/1/2018		$222.22	$222.22	
11/1/2018	Update Partners at twice-annual Fire Coordination Meeting	Give update at meeting with discussion about mesquite control	12/15/2018		$222.22	$222.22	
12/1/2018	Science Advisory Board Meeting	Present results and updates to Science Advisory Board for discussion and progress check	12/15/2018		$0.00	$4,500.00	
2/20/2019	Update Partners at twice-annual Fire Coordination Meeting	Give update at meeting with discussion about mesquite control	3/20/2019		$222.23	$222.23	
3/1/2019	Science Advisory Board Meeting	Present results and updates to Science Advisory Board for discussion and progress check	3/15/2019		$0.00	$4,500.00	
5/1/2019	1-year monitoring check	Photo monitoring	5/31/2019		$5,600.00	$2,348.20	
		Remote Sensing completed by Quiet Creek	5/31/2019	-	-		
6/1/2019	Science Advisory Board Meeting	Present results and updates to Science Advisory Board for discussion and progress check	6/30/2019		$0.00	$4,500.00	
6/1/2019	Final Report	Complete final report of result 1 year after treatment	7/31/2019		$2,000.00	$2,509.20	
9/1/2019	Final Report Presentation	Present final results to AVCA Board	9/30/2019		$222.23	$222.23	
		Present final result to Science Advisory Board	9/30/2019		$0.00	$4,500.00	
		Posted to our website and sent to our partners via e-news	9/30/2019	-	-		

Appendix D. State Historic Preservation Office (SHPO) Form

Any ADEQ action, including grant projects paid in-part with ADEQ funds, on state, federal, or private lands that may impact historic properties (i.e., any prehistoric or historic-period district, site, building, structure, or object included in, or eligible for inclusion in the State Register of Historic Places) require consultation with the State Historic Preservation Office (SHPO) pursuant to the State Historic Preservation Act (ARS 41-861 to 864). ADEQ is legally responsible for making determinations and findings.

In order to make informed decisions and facilitate consultation with SHPO, ADEQ requires applicants to provide the project related information requested below. By working together, we can seek out ways that "the historical and cultural foundations of this state can be preserved as a living part of our community life and development" (State Historic Preservation Act).

For Each On-the-ground Project Site

Please prepare and answer the following questions pertaining to historic properties and preservation. Use multiple forms as needed. Add map(s), drawings and pictures where appropriate. When complete, copy and paste this information into your grant application in the requested area.

1. Project Location

Indicate the location of the project sites, including:

- County,
- Township, range and section
- Nearest Town or City

Describe the conditions of the land in the project area. Attach a copy a USGS topographic map with the project area clearly marked. On the map, please specify the area(s) where impacts will occur.

Provide project location information (use as much space as needed)

We have three project areas on three different ranches. They are rangelands located in the Altar Valley, about 30 miles southwest of Tucson. The nearest town is Three Points, Pima County. The proposed project areas are outlined in 4 attached maps.

2. Project Description:

Describe the buildings or structures within project area and their age. Describe any ground-disturbing activities. Indicate whether the proposed project could impact historical properties, should they be present.

Provide project description (use as much space as needed)

There are no buildings on any of the proposed project sites. There is ranching infrastructure including pasture fence and one water tank on the Elkhorn Ranch project area.

3. Steps Taken to Identify Historic Properties

- Indicate whether the project area has been previously surveyed to determine the presence or absence of historic properties? If it has, attach a report.
- Are buildings, structures, or objects 50 years old or older present in the project area? If yes, include description.
- Are any prehistoric or historic-period archaeological sites present? If yes, please list and briefly describe.
- What does the state or federal land manager, if any, say about historic properties present in the project area? Attach letter, if applicable.
- What efforts, if any, would be reasonable to determine the presence or absence of historic properties?

Provide synopsis of steps taken to identify historic properties (use as much space as needed)

These areas have not been surveyed because there will be no impact on the ground by the proposed treatment. The only structure older than 50 years old is the water tank on the Elkhorn Ranch site, which is ranching infrastructure on State Trust Land. There are no known prehistoric sites in the proposed project areas

4. Potential for Historic impacts

In the applicant's opinion, which determination listed below is appropriate for this project based on the information presented above:

- ☒ No impacts/ historic properties not present
- ☐ No impacts/ historic properties present. Describe how historic properties will be avoided or protected.
- ☐ Negative impacts to historic properties. Suggest treatment measures.
- ☐ Positive impacts to historic properties. Describe any positive impacts to historic properties that could be attributed to the proposed project.

Describe how any negative impacts to historic properties will be avoided and describe potential positive impacts (use as much space as needed)

There will be no negative impact. Proposed treatment could reduce erosion and soil loss, providing potential positive conservation outcomes for the area, including infrastructure.

For SHPO Use Only - Record of Consultation

SHPO advises ADEQ on the completeness of identification effort, determination of effect, and any proposed treatment measures.

___Concur with determination
___Do not concur with determination
___Request More Information
___Recommend that the project area be surveyed to determine the presence or absence of historic properties by a qualified professional
___Additional comments attached

Signed: _____ Date: _____

Abbreviated Monitoring Plan (AMP):
ADEQ Water Quality Improvement Grant Program

When to use this form: This form is intended to document plans for sampling water quality and monitoring best management practices on individual grant projects under ADEQs Water Quality Improvement Grant program and NRCS National Water Quality Initiative. This AMP is intended to provide more specific sampling and monitoring details than could be described in a watershed-scale Sample and Analysis Plan (SAP). Specific methodologies will be identified here and reference ADEQs Standard Operating Procedures (SOP; 2014) for such measures.

Grant Project Name: Sediment Discharge Reduction Through Brush Management in the Altar Valley

Grant ID#: _____

Project Location: Altar Valley, Arizona

Provide a Brief Description of the Project:

Mesquite encroachment in the Altar Valley, located 30 miles southwest of Tucson, has reduced historic grasslands and vegetation cover, causing increased erosion, soil loss, and high rates of sediment pollution downstream. The Altar Valley Conservation Alliance (AVCA) is proposing the use of the aerially applied herbicide, Sendero Plus Premix, to reduce mesquite densities on 2,000 acres of rangeland to promote the return of desert grassland, improve soil conservation, and reduce erosion and sediment pollution.

Preparer: Kyle Thompson **Date:**

Approvals:

Unit Manager: Date:

Grant Project Manager: Date:

Additional copies of this form will be provided to: (Check all that apply)

- ☐ Unit Manager
- ☐ Team Leader
- ☐ Grant Project Manager
- ☐ ADEQ Project Manager
- ☐ Team Members
- ☐ Project File

WATER QUALITY EFFECTIVENESS MONITORING

All work described in this Abbreviated Monitoring Plan shall follow procedures detailed in the appropriate SOP or equivalent.

Provide the following information about the Project Technical Design:

Site(s) to be sampled (*include a map*): Please see attached project maps for Elkhorn Ranch, Santa Margarita Ranch, and Anvil Ranch project sites

Sampling points:

Provide the rationale for selecting the sampling points:

Sample Type(s):

Quality Control (QC) Samples Collected:

Special Sample Requirements:

List any Special Training Requirements:

Projected Sampling Date(s):

Sampling Table:

Site ID #	Site Name	Latitude	Longitude	Analyte(s)

Field Sampling Requirements: Field notes will be recorded in a field notebook or tablet computer. Measurements will be recorded on appropriate field sheets, which will be maintained by the Sampling Team Leader. Samples will be collected in accordance with established procedures.

Field Measurements should include: pH, temperature (°C; water and ambient), dissolved oxygen (mg/L and % saturated), specific conductance (µS/cm), Total Dissolved Solids (TDS; mg/L), turbidity (NTU), and flow (cubic feet per second). See attached field sheet.

List Sampling SOPs to be followed:

Sample Handling and Custody Requirements:

Laboratory:

Copy of Chain of Custody Attached: Yes: ☐ No: ☐ Explain:

BEST MANAGEMENT PRACTICE EVALUATION

All work described in this Abbreviated Monitoring Plan shall follow procedures detailed in the appropriate SOP or equivalent.

BMP Objective(s):

Reduce mesquite density to promote the return of desert grassland, improve soil conservation, and reduce erosion and sediment pollution.

(e.g., To reduce sheet erosion in rangelands and sediment discharge from shrub encroached grassland by reducing shrub cover and increasing perennial grass and substrate cover).

Type of BMP(s): Aerially applied herbicide, Sendero Plus Premix.

Projected BMP Evaluation Date(s): April 2018, June 2018, May 2019

BMP Evaluation Table: (Complete the table below)

BMP Site Name	Latitude	Longitude	Type of BMP	BMP area (ac) or length (ft)	Install Date	Photopoint (Y/N)	Pretreat Data (Y/N)	Control Sites or Data (Y/N)	Monitoring Locations (#)	Water Quality Monitoring at BMP (Y/N)

BMP Site Name (e.g., Willow wash rock dam 1, Willow wash rock dam 2); Latitude and longitude = center point of BMP

BMP Evaluation Requirements: Field notes and measurements will be recorded in a field notebook or tablet computer, which will be maintained by the Team Leader.

BMP evaluations are to take into account the type of action, availability of pre-treatment data and/or paired control sites, and the desired or practical level of assessment or monitoring. BMP evaluations may include, but are not limited to: visual assessments, photographic monitoring, and/or quantitative data gathering and analysis (e.g., via vegetation transects, total station analysis, bottom deposit assessment, bank pins and other bank stability methods, and any other evaluation methods deemed appropriate).

List BMP Evaluation Sampling SOPs to be followed:

PHOTOGRAPHIC MONITORING

Photographic monitoring is one of the best ways to document changes/improvements as a result of BMPs. Each photographic monitoring trip should include the same data (see table) and should be executed the same way every time. The latitude and longitude, direction of photo, marker to ensure photos can be duplicated, what the picture is capturing, and who is taking the photograph are all important pieces of information to include.

Photographic Monitoring Table: (Table should be completed during each photo monitoring visit)

Date	Image #	Point ID	Type of Marker	Latitude	Longitude	BMP	Direction of Photos	Description of Photos

Point ID = Site ID or other ID; Type of Marker = t-post, rebar, etc.; Direction of photos = cardinal direction: N, S, E, W; Description of photos = general observations, key features

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HEALTH AND SAFETY

Phone Numbers:

Nearest Hospital Emergency Room: 520-324-5700

Police: 520-822-5355

Border Patrol: 877-2275511

Safety Table

Hazard	PPE	Precautions
Flash Flood	N/A	Use extreme caution when crossing flooded river fords in vehicles. Beware of changing weather conditions and be prepared to seek higher ground. Observe rules of thumb; Don't wade in stream over factor of 9 (i.e., depth ft x velocity ft/s > 9).
Lightning	N/A	Take cover in vehicle or building
Contact with chemicals and poor quality water	Nitrile Gloves, Safety Glasses, Hip/Chest Waders	Avoid direct contact with polluted stream water. Wash-up thoroughly before eating, drinking, etc. Some sample bottles contain sulfuric or nitric acid, use caution when handling.
Heat Stress	N/A	Drink plenty of potable water; wear a hat and light colored clothing. Take breaks as needed.
Hypothermia	Rain/snow gear	Expect sub-freezing and wet conditions during winter months. Keep dry.
Wildlife – snakes and other poisonous critters. There is a potential for Africanized bees	Snake leggings	Use caution walking to sites. Avoid dark color clothing (attracts bees).
Slips, Trips, and Falls	Deep lugged boots and flash lights at night	Use good footings, and ropes for assistance down steep slopes. Watch where you're going.

Map of Water Quality Sampling Locations (include BMP locations where applicable):

Map of Best Management Practices and BMP Evaluation Locations:

Please see the attached Project Area Maps for each ranch. Monitoring of the treatment areas will be completed with repeat photography (best locations to be determined with the expertise of our partner rangeland scientists and ranchers) and aerial mapping with drones or satellite imagery. We will be treating the area within these outlined areas, targeting specific stands and swaths of mesquite trees. These areas will first be surveyed with remote sensing technology by satellite or drone; whichever will provide the most affordable and effective monitoring technique.

The following information shall be considered part of the Abbreviated Monitoring Plan unless noted otherwise.

Project Organization and Task Responsibilities:

1. Project Manager is responsible for comprehensive oversight and final decision making for the Project.
2. Team Leader is responsible for:
    - Assembling team and briefing members on requirements of the project
    - Supervising preparation of equipment
    - Overall collection of samples, record keeping, and delivery to laboratory (water quality)
    - Safety of field personnel
    - Overall coordination and documentation of field activities related to the project
3. Quality Assurance (QA) Coordinator will oversee the preparation of the sampling plan and is available to review and approve plans. Questions regarding validity and usability of data will be directed to the QA Coordinator.

Data Quality Indicators:

Representativeness is the degree to which data accurately and precisely represent a characteristic of an environmental condition or a population. One time sampling events should focus on issues related to judgmental sampling and why certain areas are included or not included and the steps being taken to avoid either false positives or false negatives.

Comparability expresses the confidence with which one data set can be compared to another. This is accomplished by using standardized methods for sample collection and analysis.

Completeness is the amount of acceptable quality data collected as compared to the amount needed to ensure that the uncertainty or error is within acceptable limits.

Instrument, Equipment and Supplies, Testing and Maintenance Requirements:
Instruments will be calibrated and maintained in accordance with manufacturer instructions and the procedures outlined in appropriate Standard Operating Procedures (SOPs). Water quality sample containers will be pre-cleaned containers.

Assessment/Oversight:
Identification of problems related to technical performance will be the responsibility of the technical staff working on this project. The Sampler will assess any problems that arise in the field, and if needed and will communicate with the Project Manager and any technical staff. Any changes in technical procedures will be documented in field notes and highlighted in reports related to this project.

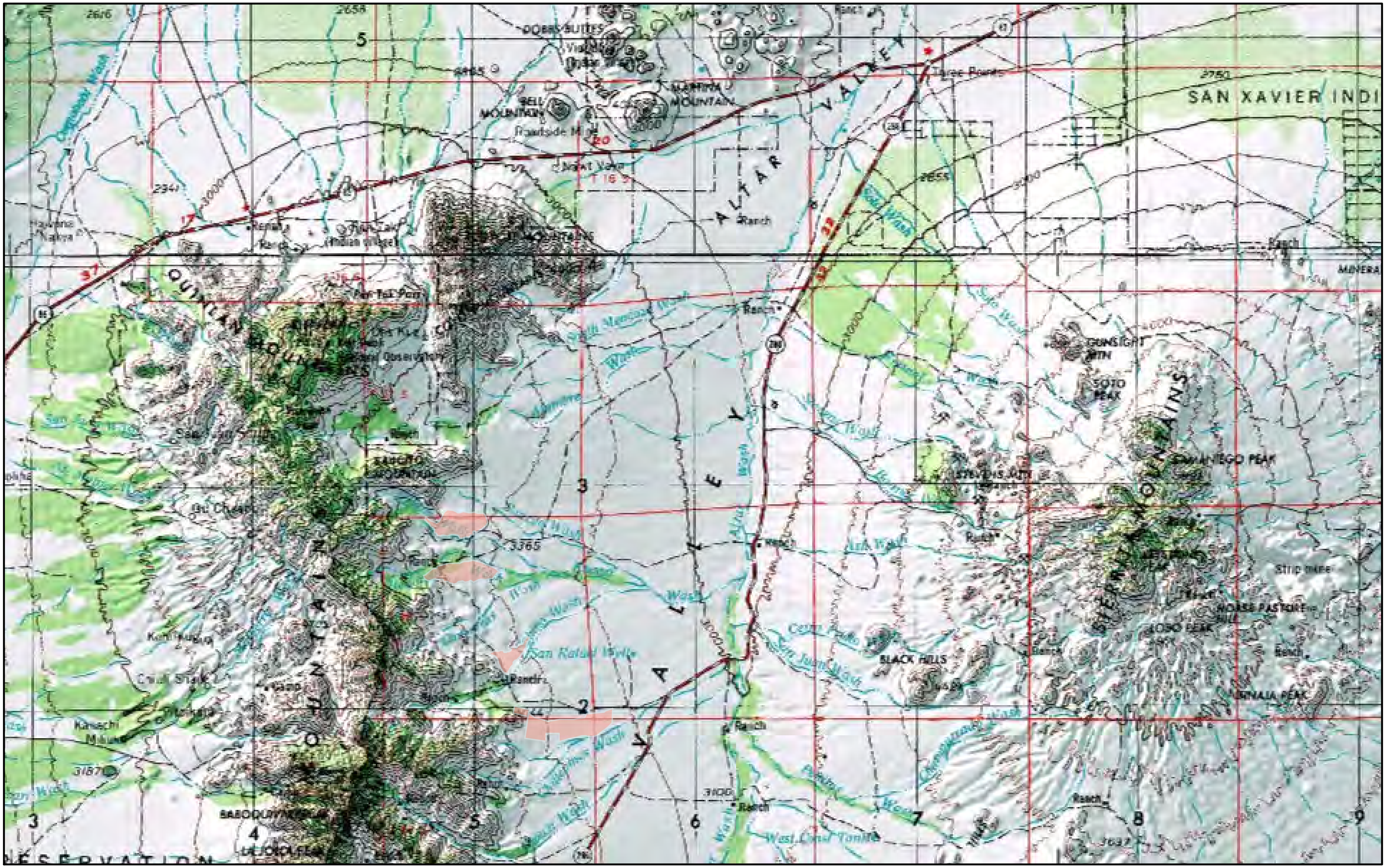
Data Review, Validation and Usability:
All data will be reviewed and verified by Team Leader. Water quality data from laboratories will be initially validated by the laboratory performing the analysis. Any questions regarding the verification and usability of the data will be discussed with ADEQ's Quality Assurance Unit and decisions made appropriately.

Documentation and Records:
The Team Leader will prepare a summary of the sampling activities for the day. The summary should include the following:

- Name of Team Leader and Team Members
- Number and location of water quality samples collected by matrix including QA/QC samples
- Number and location of BMPs to be evaluated
- Locations of photographic monitoring
- On-site measurements made and results obtained at each location (including times)

- Disposition of all samples (where they were delivered for analysis)
- Photocopies of Chain of Custody
- Noteworthy observations at each sampling location

Altar Valley Brush Control Sites



12/7/2017, 10:54:37 AM

Brush New

1:245,421

0 2 4 8 mi

0 3.25 6.5 13 km

Web AppBuilder for ArcGIS

Altar Valley Brush Control Sites

12/7/2017, 10:51:34 AM

Brush New

1:61,407

0 0.5 1 2 mi

0 0.75 1.5 3 km